

WEST

Generate Collection

L1: Entry 12 of 17

File: DWPI

Feb 1, 1999

DERWENT-ACC-NO: 1991-001176

DERWENT-WEEK: 200038

COPYRIGHT 2002 DERWENT INFORMATION LTD

TITLE: Depositing CVD silicon di:oxide film of tailored properties - using vapour mixt. of oxidiser, silicon cpd. free of silicon-oxygen bonding and silicate cpd.

INVENTOR: MAHAWILI, I

PRIORITY-DATA: 1989US-0370331 (June 22, 1989)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
KR 162652 B1	February 1, 1999		000	H01L021/316
EP 404101 A	December 27, 1990		000	
JP 03036269 A	February 15, 1991		000	
EP 404101 B1	May 1, 1996	E	017	H01L021/316
DE 69026756 E	June 5, 1996		000	H01L021/316
JP 2918300 B2	July 12, 1999		012	C23C016/42

INT-CL (IPC): C23C 16/40; C23C 16/42; H01L 21/31; H01L 21/316

ABSTRACTED-PUB-NO: EP 404101A

BASIC-ABSTRACT:

Hard, protective CVD SiO₂ is deposited on a geometric substrate form a vapour mixt. of oxidiser, plus 5-95 wt. parts each of an Si cpd. (I) having its Si free of direct bonding to an O at. and a silicate (II) with at least one Si bonded to an O at. The ratio of (I) to (II) is pref. selected to achieve a desired combination of hardness or density and conformality and other properties.

USE/ADVANTAGE - Esp. as a dielectric film for solid state devices. A desired combination of film properties can be obt'd.

ABSTRACTED-PUB-NO:

EP 404101B EQUIVALENT-ABSTRACTS:

A CVD method for depositing silicon dioxide as a hard, protective film on a substrate having steps on its surface, especially for a solid state device, comprising the steps of arranging the substrate in a closed chamber of a CVD reactor, said reactor including means for controlling temperature and pressure within said chamber, introducing a composite deposition compound and an oxidizing compound in a vapour phase into the chamber adjacent the substrate, the composite deposition compound being selected to be of a combination of a first deposition compound and a second deposition compound, said first deposition compound being a silicon source compound having silicon free from direct bonding to oxygen and being contained in said composite compound in approximate 5 to 95 parts by weight and said second deposition compound being a silicate source compound with at least one oxygen directly bonded to its silicon, and thermally disassociating the composite deposition compound and the oxidizing compound in the vapor phase and adjacent the substrate at a temperature exceeding approximately 300 deg. C, to cause deposition and formation of the silicon dioxide film on said substrate.

WEST

Generate Collection

L1: Entry 4 of 17

File: DWPI

Dec 28, 1999

DERWENT-ACC-NO: 2000-105309

DERWENT-WEEK: 200009

COPYRIGHT 2002 DERWENT INFORMATION LTD

TITLE: Platform for supporting large semiconductor substrates during rapid high-temperature processing

INVENTOR: MAHAWILI, I

PRIORITY-DATA: 1997US-0979604 (November 26, 1997)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
US 6007635 A	December 28, 1999		012	C23C016/00

INT-CL (IPC): C23C 16/00

ABSTRACTED-PUB-NO: US 6007635A

BASIC-ABSTRACT:

NOVELTY - A removable platform has a central opening and a recessed support surface that receives the non-device side of the substrate. It is located on a support surface in the chamber over a heater so that heat flux is transmitted to the substrate through the central opening. Both the platform and support surface are able to undergo unrestrained radial relative thermal expansion during processing.

DETAILED DESCRIPTION - The chamber has a rotatable housing to which the annular platform is coupled.

USE - Support for substrates of diameter at least 300 mm during high-temperature processing, particularly thin film deposition, oxide growth, etching or annealing.

ADVANTAGE - Maximised heat transfer to substrate while eliminating contact of reactive gases with non-device side of substrate.

WEST

Generate Collection

L1: Entry 11 of 17

File: DWPI

Jan 30, 1991

DERWENT-ACC-NO: 1991-030839

DERWENT-WEEK: 199105

COPYRIGHT 2002 DERWENT INFORMATION LTD

TITLE: Chemical vapour deposition reactor - has multiple gas inlet orifices and exhaust ports for controlling gas flow vectors toward substrate

INVENTOR: MAHAWILI, I

PRIORITY-DATA: 1989US-0386903 (July 28, 1989)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
EP 410442 A	January 30, 1991		000	
JP 03071624 A	March 27, 1991		000	
US 4993358 A	February 19, 1991		000	

INT-CL (IPC): C23C 16/44; C30B 25/14; H01L 21/20

ABSTRACTED-PUB-NO: EP 410442A

BASIC-ABSTRACT:

A chemical vapour deposition reactor consists of a housing forming a chamber suitable for maintaining a deposition substrate in an environment of selected pressure with means to support the substrate in the chamber. Multiple manifolds are arranged each with a regulator for introducing reactant gas or a vacuum to the chamber. Multiple exhaust vents are in communication with the chamber each with a valve for inducing a selected pattern of flow vectors for the reacted gas in the chamber adjacent to the substrate in order to enhance deposition uniformity.

USE/ADVANTAGE - Chemical vapour deposition (CVD) methods and reactor devices have long been employed for depositing films of materials on selected substrates. The materials may be deposited by a variety of techniques for a variety of applications employing a substantial number of CVD reactor designs. Due to the need to achieve ever greater coating uniformity and deposition conformity there is a need for further improvements in CVD reactors. The invention provides a CVD reactor design which enhances coating uniformity and deposition conformance.

ABSTRACTED-PUB-NO:

US 4993358A EQUIVALENT-ABSTRACTS:

Chemical vapour deposition reactor (10) has a cylindrical shell housing (12) with closed axial ends (16,18), the lower wall (16) forming a heater housing with pins (20) supporting a substrate (22) in the chamber (24). The upper wall (18) is an injector housing, with a plate (28) forming radially spaced manifolds (32-50) and an inner plate (30) with an array of sonic orifices (32A-50A). Exhaust vents are arranged about the periphery of the chamber in communication with external exhaust members (62), each with a separate control valve (64). At least one additional exhaust passage (66) is formed in an axially central position.

ADVANTAGE - Enhanced coating uniformity. @(12pp)@

WEST☐ Generate Collection

L1: Entry 13 of 17

File: DWPI

May 13, 1987

DERWENT-ACC-NO: 1987-130566
DERWENT-WEEK: 198719
COPYRIGHT 2002 DERWENT INFORMATION LTD

TITLE: Film deposition on wafer by CVD - controlled to obtain selected film thickness profile

INVENTOR: MAHAWILI, I

PRIORITY-DATA: 1985US-0796675 (November 8, 1985)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
EP 221429 A	May 13, 1987	E	014	
JP 62114215 A	May 26, 1987		000	
US 4834022 A	May 30, 1989		011	

INT-CL (IPC): C23C 16/44; H01L 21/20

ABSTRACTED-PUB-NO: EP 221429A

BASIC-ABSTRACT:

(A) A film of selected thickness profile is deposited onto a wafer by locating the wafer in a chamber into which one or more gases are introduced to effect film deposition, the novelty being the creation, within the chamber adjacent the wafer of a region configured in accordance with the desired film thickness profile.

(B) Appts. for carrying out process (A) is also claimed. (C) Also claimed is appts. for film deposition onto a wafer, comprising a deposition chamber with nozzles located near the periphery of the chamber wall opposite the wafer for directing a gas away from the centre of the chamber, a deflection system being provided for deflecting the gas towards the centre of the chamber.

USE/ADVANTAGE - The method and appts. are used for chemical vapour deposition of films on semiconductor wafers. Films of uniform thickness or of controlled non-uniform profile can be produced.

ABSTRACTED-PUB-NO:

US 4834022A EQUIVALENT-ABSTRACTS:

CVD reactor for processing semiconductor wafers has a reactor chamber (55) formed of a heater section (1) and a gas distribution section (18), with an inner cylindrical housing (38), circular top plate (27), plate (29) extending inwards from the walls of the housing (31), and a platform (4). The wafer holding platform is attached to the heater mantle (2) at an angle of 3-5 deg. from the vertical, and has a circular well for holding the wafer (W). Gas is introduced into the reactor chamber via orifices (48b) forming one side of an annular chamber (44) recessed in the top plate of the reactor chamber. plate 846) attached to the injector plate (48b) having a configured surface establishes specified distances between it and points on the wafer surface, giving a predetermined thickness profile of deposited film.

ADVANTAGE - Controlled thickness can be achieved over the semiconductor surface without deleterious edge effects. (11pp)

WEST☐ Generate Collection

L1: Entry 15 of 17

File: DWPI

Mar 27, 1985

DERWENT-ACC-NO: 1985-076029

DERWENT-WEEK: 199609

COPYRIGHT 2002 DERWENT INFORMATION LTD

TITLE: Vapour deposition appts. - heats the semiconductor wafer by means of external radiation transmitted through cooled window

INVENTOR: MAHAWILI, I

PRIORITY-DATA: 1983US-0522638 (August 11, 1983)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
EP 135308 A	March 27, 1985	E	014	
JP 96008212 B2	January 29, 1996		005	H01L021/205
JP 60089920 A	May 20, 1985		000	
US 4550684 A	November 5, 1985		000	
US 4680447 A	July 14, 1987		000	
EP 135308 B	September 21, 1988	E	000	
DE 3474163 G	October 27, 1988		000	

INT-CL (IPC): C23C 13/08; C23C 14/28; C23C 16/46; C23C 16/48; H01L 21/20; H01L 21/205; H05B 1/00

ABSTRACTED-PUB-NO: EP 135308A

BASIC-ABSTRACT:

Vapour-deposition appts. comprises: a housing contg. a semiconductor wafer; an external heater; and a window in the housing for transmitting radiation from the heater to the wafer, the window having its own temp. control means, pref. a temp. control fluid flowing between first and second window plates.

USE/ADVANTAGE - In vapour deposition of thin layers on Si, GaAs, etc. Method avoids need for wafer substrates to conduct heat to the wafer, thus permitting better temp. control in the deposition chamber.

ABSTRACTED-PUB-NO:

EP 135308B EQUIVALENT-ABSTRACTS:

Apparatus for heating semiconductor wafers comprising: a housing for containing a wafer of a semiconductor material; heating means arranged externally of the housing, for generating light; and window means forming at least a part of the housing and interposed between the heating means and the wafer to enable light from the heating means to pass into the interior of the housing in the direction of the wafer, the window means including first and second spaced windows defining between them a channel for cooling liquid, and an inlet to and an outlet from the channel for the cooling liquid. (7pp)

US 4550684A

Cooled optical window, for transmitting electromagnetic radiation to heat semiconductor wafers in a vapour deposition system, has two walls made from quartz plates with a space between them for passage of cooling fluid, pref. water, which is pumped between inlet and outlet. The source of heat is a metal halide lamp

producing light in the wavelength range of 0.3-0.9 microns, the colour temp. of which is greater than the energy needed to cause electronic transitions from the valence band to the conduction band in the semiconductor. The semiconductor material is either Si or Ga arsenide.

ADVANTAGE - High absorption of incident radiation is achieved, with very efficient heating of the wafer. No substrate is necessary. (6pp)

US 4680447A

For epitaxial deposition on a Si wafer (12), a deposition chamber (11) e.g. of Al contains the wafer supported by a stand (14), reactant gases being introduced through a diffusion chamber (15). The chamber has a window (16) on one side, made up of parallel quartz plates (17,18), between which water is pumped (20,21). On the other side of the window, a second chamber (23) contains a lamp (24) supplying radiant energy to the wafer, the lamp being of the halide type with a colour temp. corresp. to a wavelength in the range 0.3-0.9 micrometres. The colour temp. can be chosen to corresp. to an energy greater than that to cause transitions from the valence band to the conduction band in the semiconductor.

ADVANTAGE - Direct heating of the wafer in the gas stream without use of conductively heating substrate. (6pp)a